FIG. 1

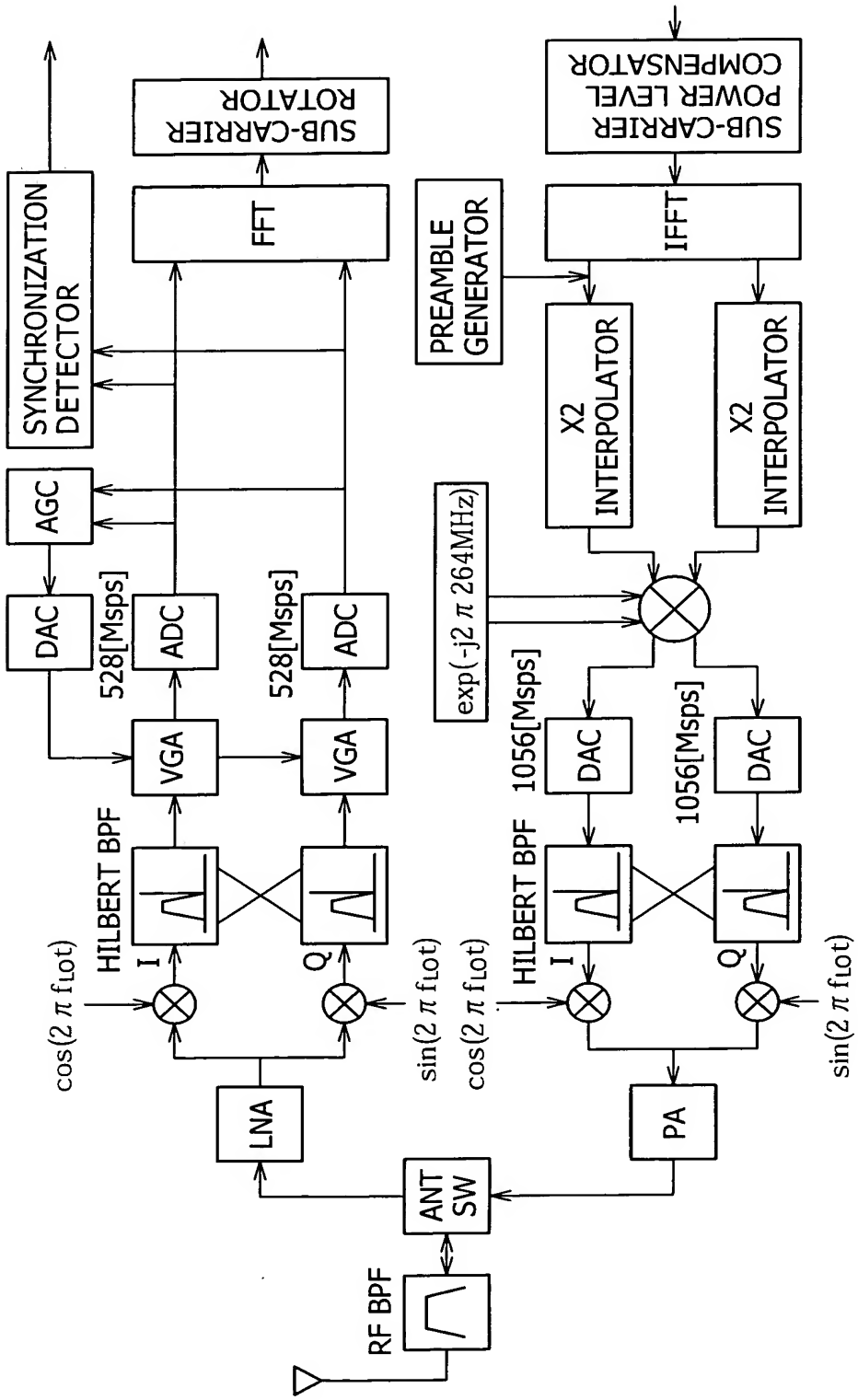

SUB-CARRIER ROTATOR
FFT
SYNCHRONIZATION DETECTOR
AGC
DAC
528[Msps]
ADC
VGA
HILBERT BPF
I
Q
cos(2 π fLOt)
sin(2 π fLOt)
LNA
ANT SW
RF BPF
SUB-CARRIER POWER LEVEL COMPENSATOR
IFFT
PREAMBLE GENERATOR
X2 INTERPOLATOR
exp(-j2 π 264MHz)
1056[Msps]
PA

FIG. 2

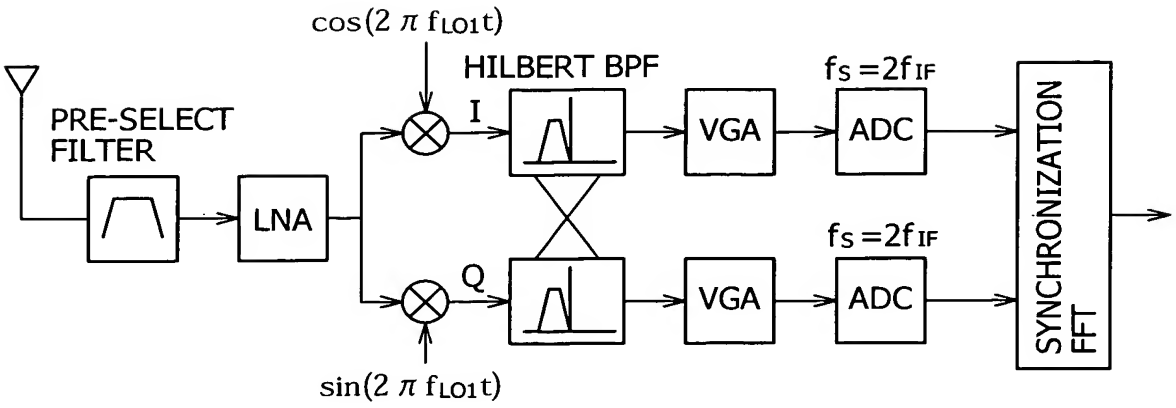


FIG. 3A

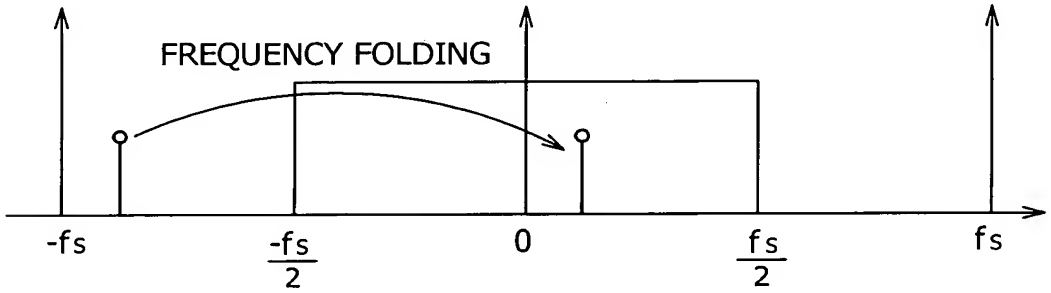


FIG. 3B

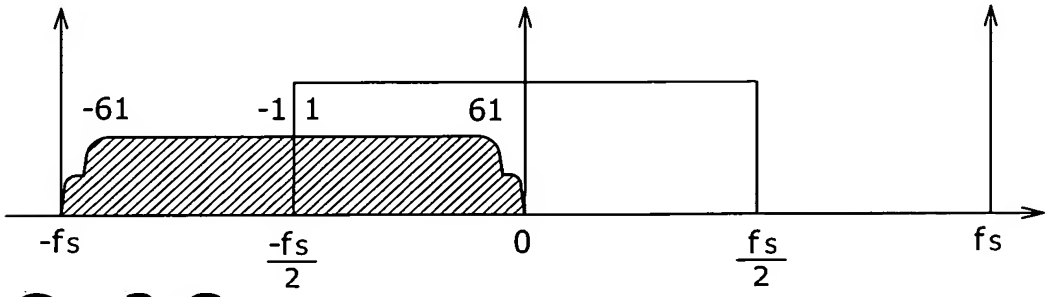


FIG. 3C

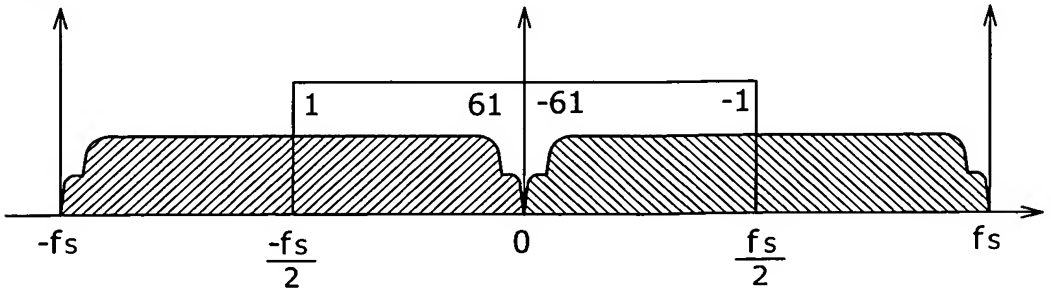


FIG. 4

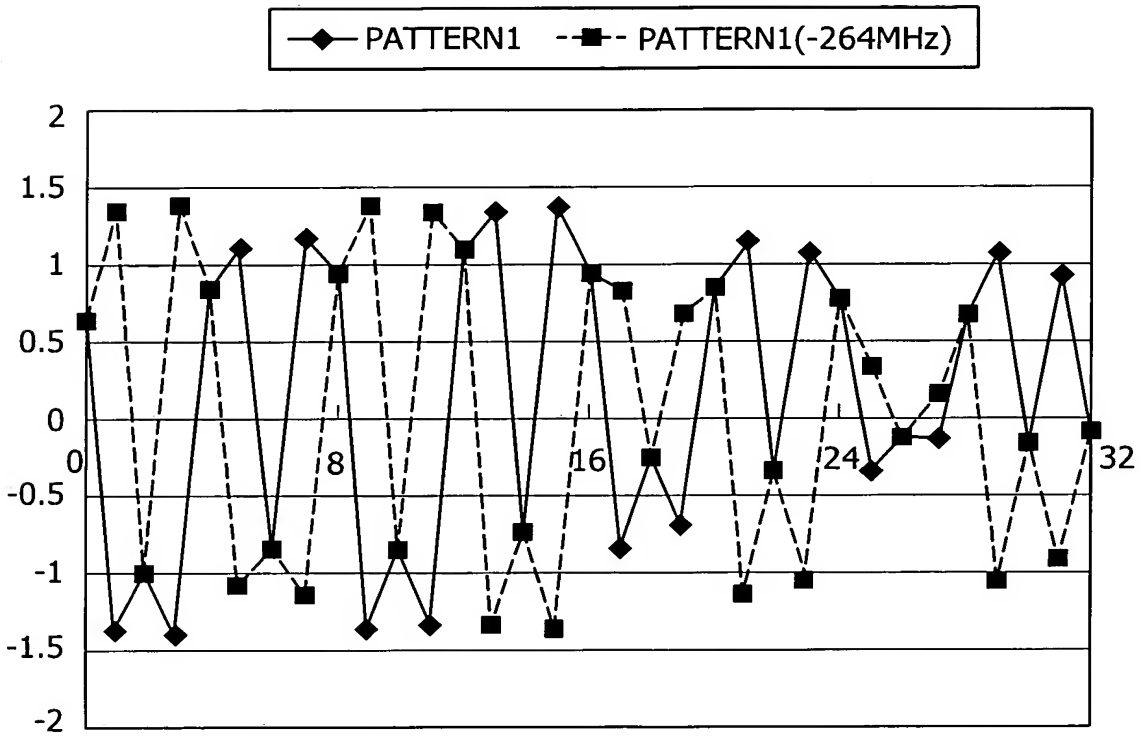

PATTERN1
PATTERN1(-264MHz)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
0
8
16
24
32

FIG. 5

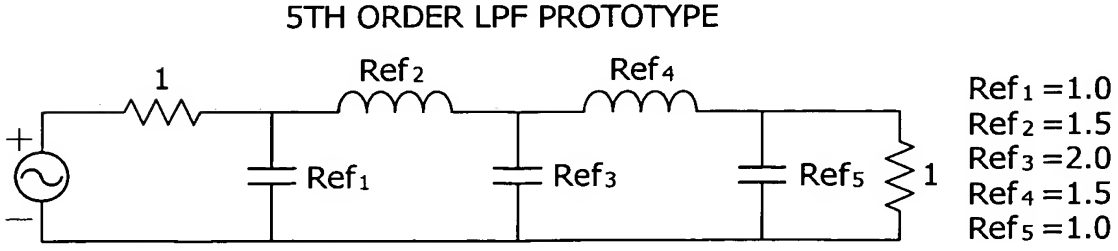

5TH ORDER LPF PROTOTYPE
1
Ref2
Ref4
Ref1
Ref3
Ref5
1
Ref1 =1.0
Ref2 =1.5
Ref3 =2.0
Ref4 =1.5
Ref5 =1.0

FIG. 6

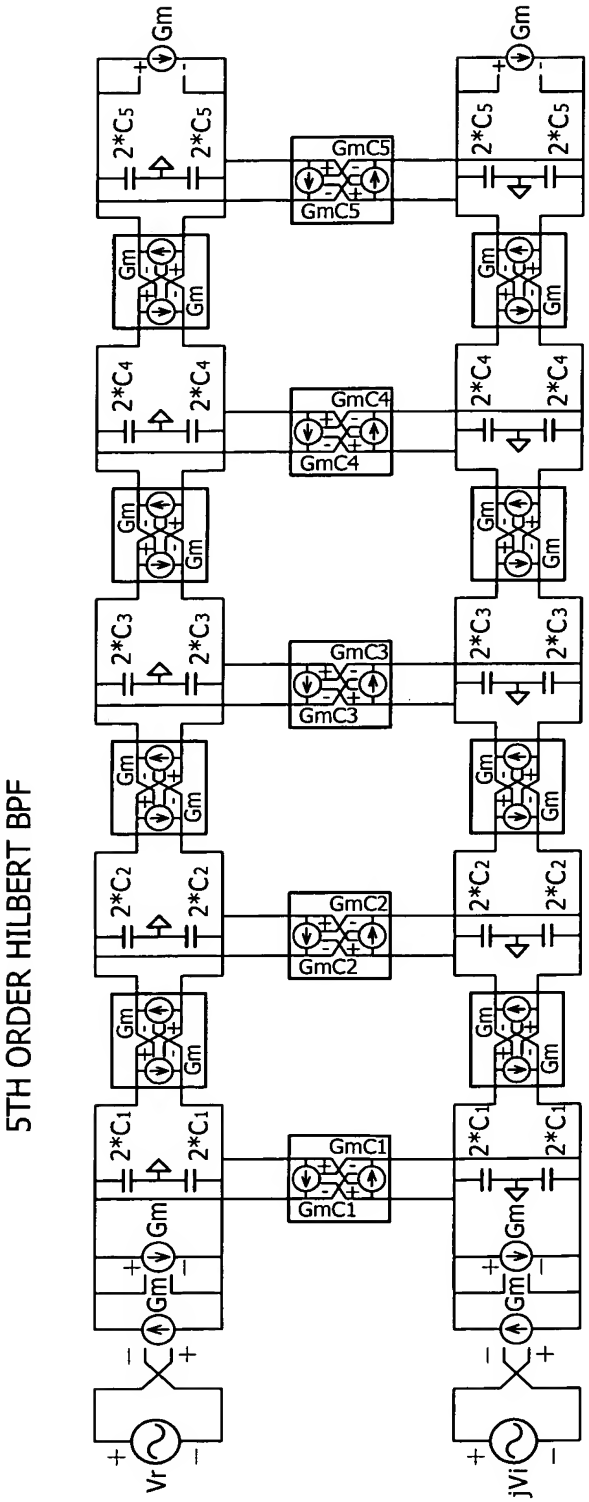

5TH ORDER HILBERT BPF
Gm
2*C5
GmC5
2*C4
GmC4
2*C3
GmC3
2*C2
GmC2
2*C1
GmC1
Vr
jVi
Cn=Refn*Gm/Wc
GmCn=Refn*Gm*Wo /Wc

FIG. 7

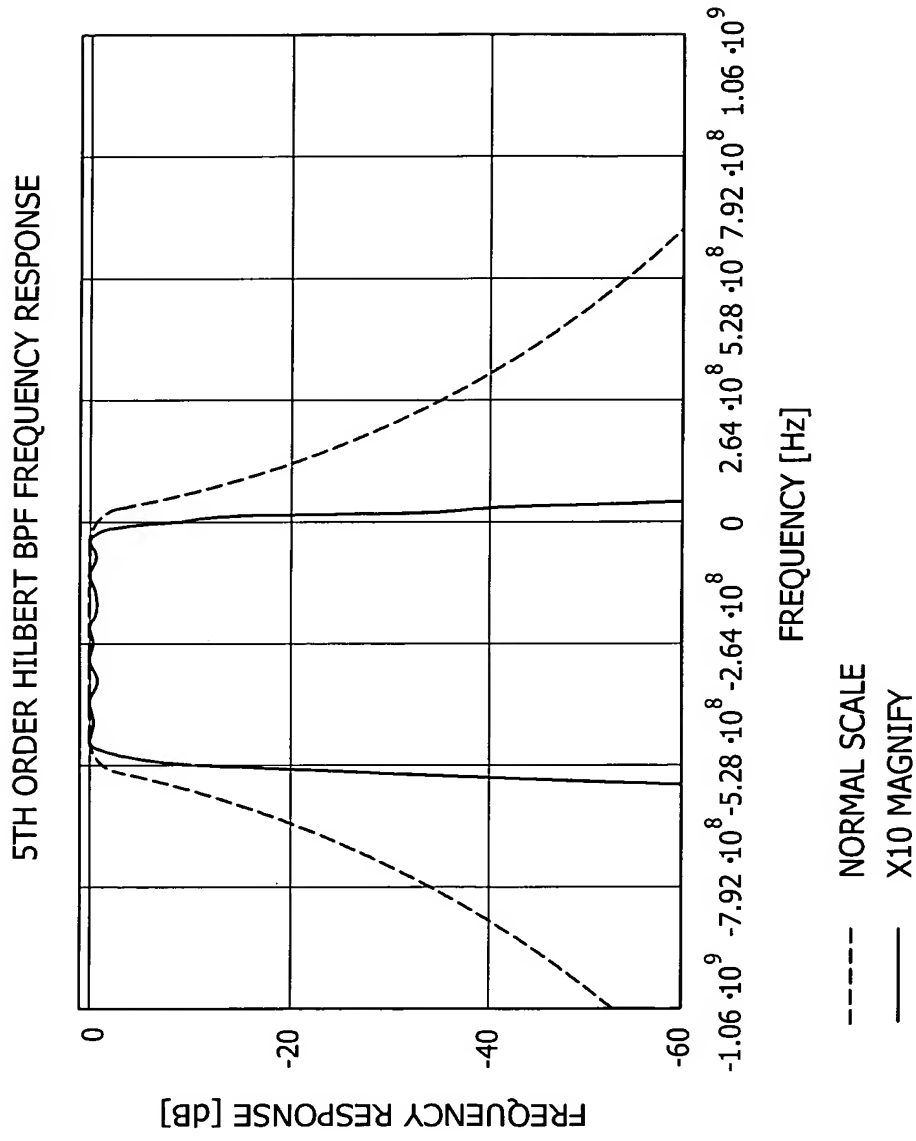

5TH ORDER HILBERT BPF FREQUENCY RESPONSE
FREQUENCY RESPONSE [dB]
0
-20
-40
-60
-1.06 ·10^9
-7.92 ·10^8
-5.28 ·10^8
-2.64 ·10^8
0
2.64 ·10^8
5.28 ·10^8
7.92 ·10^8
1.06 ·10^9
FREQUENCY [Hz]
NORMAL SCALE
X10 MAGNIFY

FIG. 8

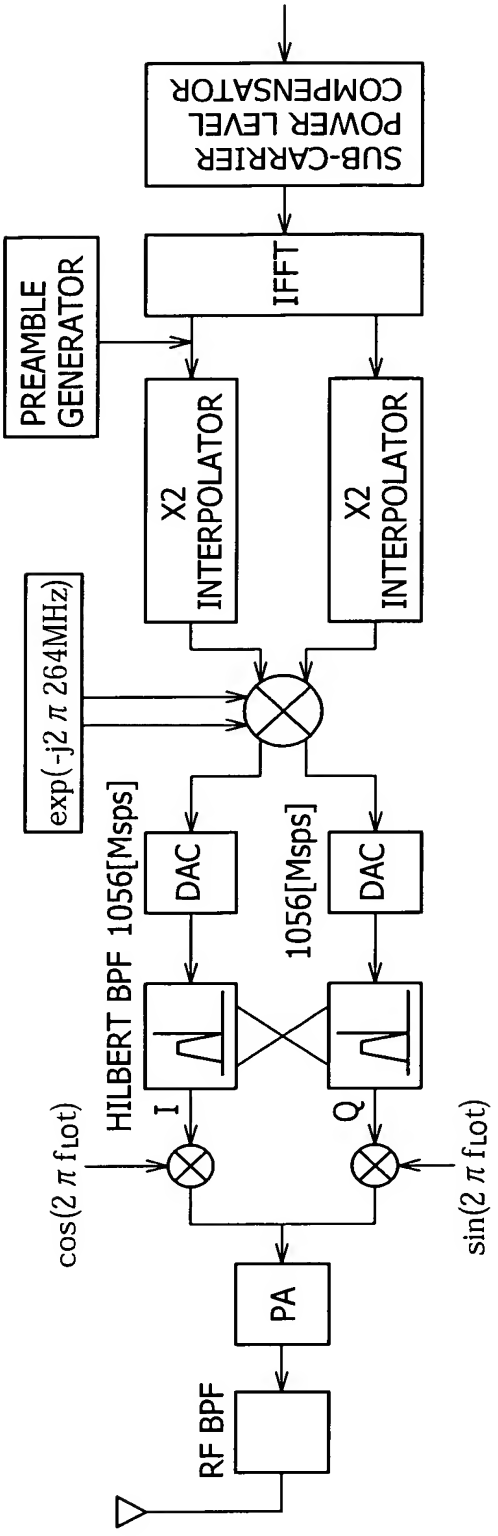

SUB-CARRIER POWER LEVEL COMPENSATOR
IFFT
PREAMBLE GENERATOR
X2 INTERPOLATOR
X2 INTERPOLATOR
exp(-j2 π 264MHz)
DAC
DAC
1056[Msps]
1056[Msps]
HILBERT BPF
I
Q
cos(2 π fLOt)
sin(2 π fLOt)
PA
RF BPF

FIG. 9

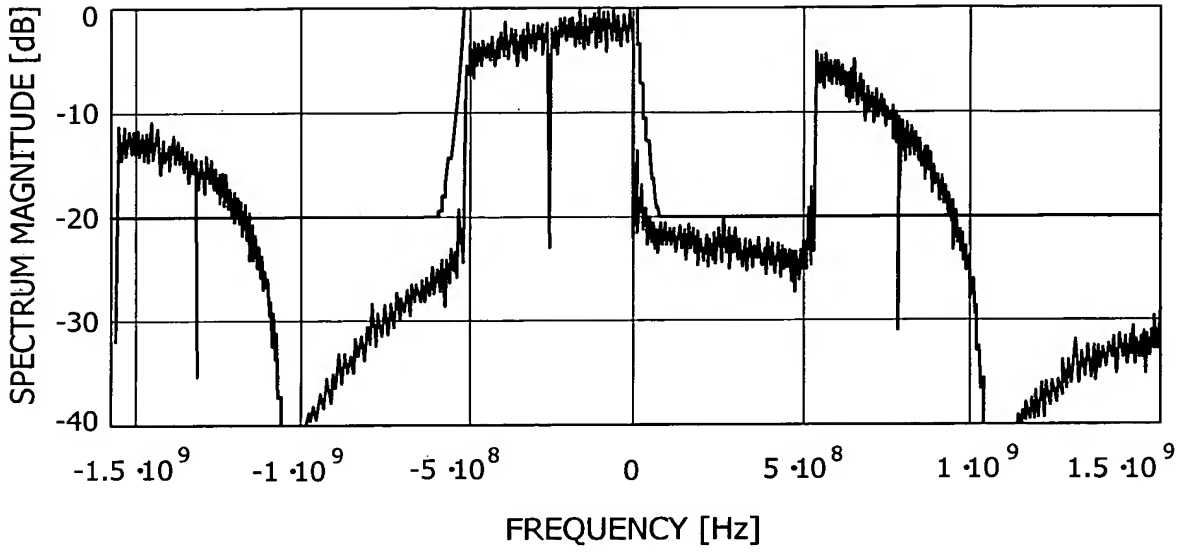

SPECTRUM MAGNITUDE [dB]
0
-10
-20
-30
-40
-1.5 ·10^9
-1 ·10^9
-5 ·10^8
0
5 ·10^8
1 ·10^9
1.5 ·10^9
FREQUENCY [Hz]

FIG. 10

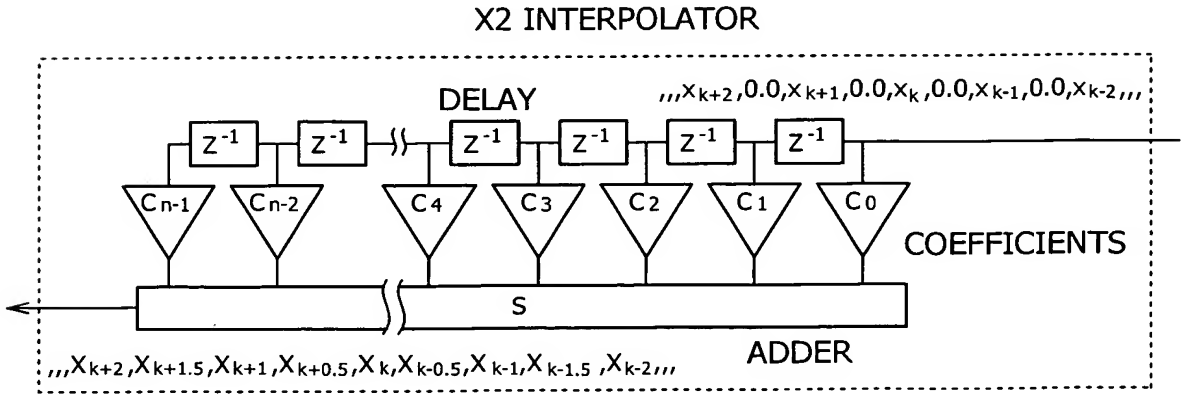

X2 INTERPOLATOR
DELAY
,,,Xk+2,0.0,Xk+1,0.0,Xk,0.0,Xk-1,0.0,Xk-2,,,
Z-1
Z-1
Z-1
Z-1
Z-1
Z-1
Cn-1
Cn-2
C4
C3
C2
C1
C0
COEFFICIENTS
S
ADDER
,,,Xk+2,Xk+1.5,Xk+1,Xk+0.5,Xk,Xk-0.5,Xk-1,Xk-1.5,Xk-2,,,

FIG. 11

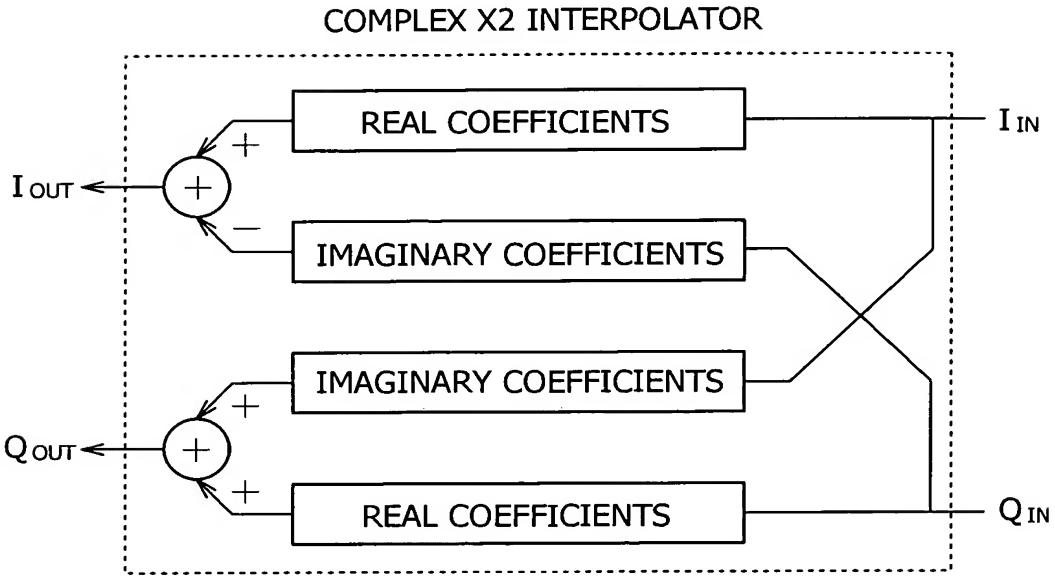

COMPLEX X2 INTERPOLATOR
REAL COEFFICIENTS
IMAGINARY COEFFICIENTS
IMAGINARY COEFFICIENTS
REAL COEFFICIENTS
I IN
Q IN
I OUT
Q OUT
+
+
−
+
+

FIG. 12

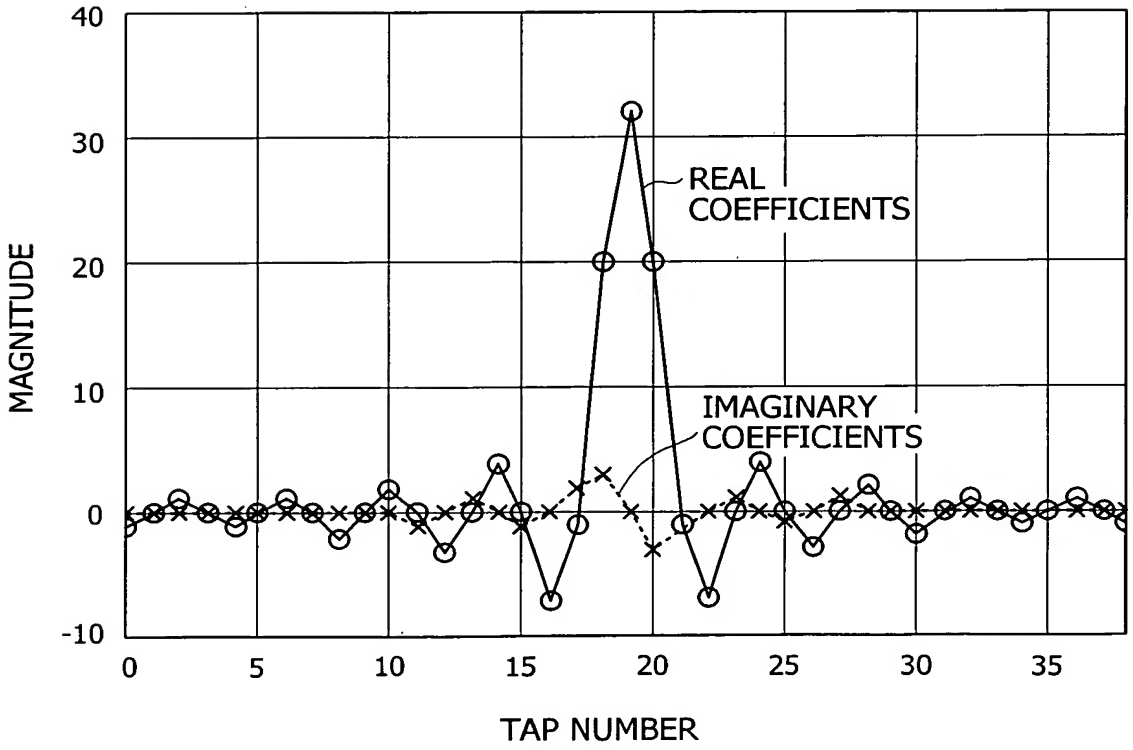

40
30
20
10
0
-10
MAGNITUDE
0
5
10
15
20
25
30
35
TAP NUMBER
REAL
COEFFICIENTS
IMAGINARY
COEFFICIENTS

FIG. 13

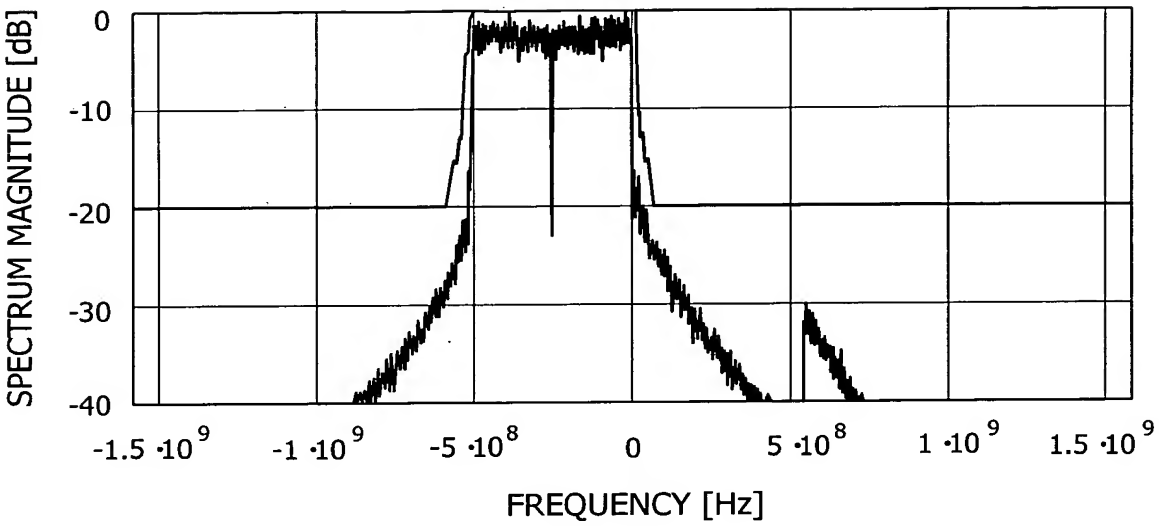

SPECTRUM MAGNITUDE [dB]
0
-10
-20
-30
-40
-1.5 ·10^9
-1 ·10^9
-5 ·10^8
0
5 ·10^8
1 ·10^9
1.5 ·10^9
FREQUENCY [Hz]

FIG. 14

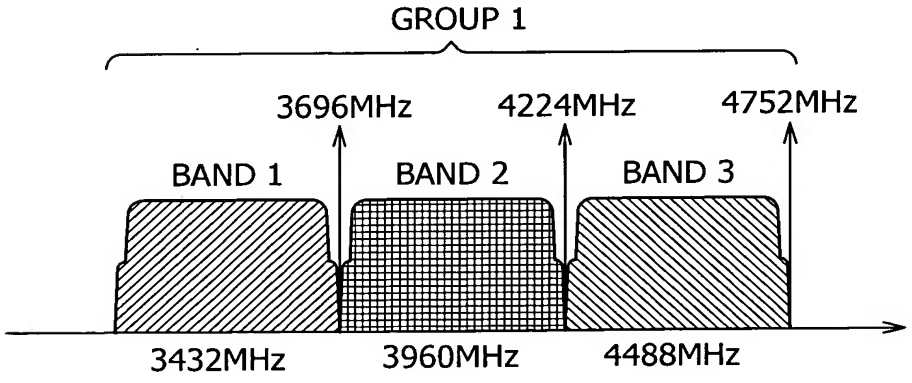

GROUP 1
3696MHz
4224MHz
4752MHz
BAND 1
BAND 2
BAND 3
3432MHz
3960MHz
4488MHz

FIG. 15

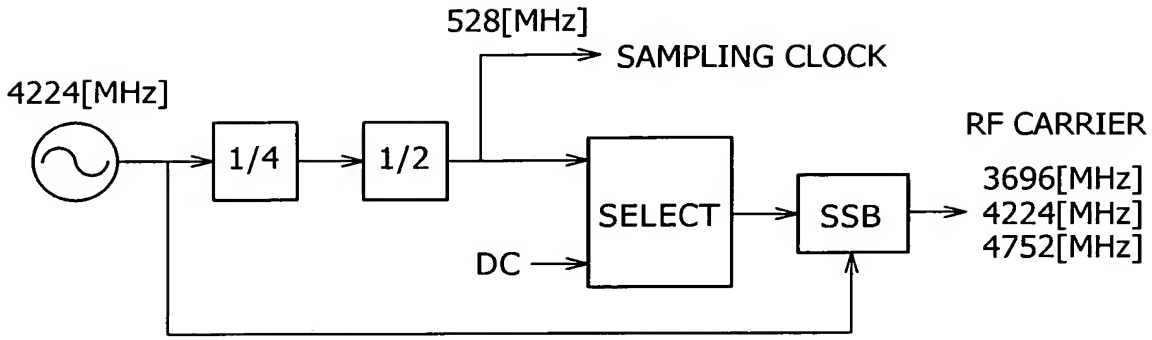

528[MHz]
SAMPLING CLOCK
4224[MHz]
1/4
1/2
SELECT
SSB
RF CARRIER
3696[MHz]
4224[MHz]
4752[MHz]
DC

FIG. 16

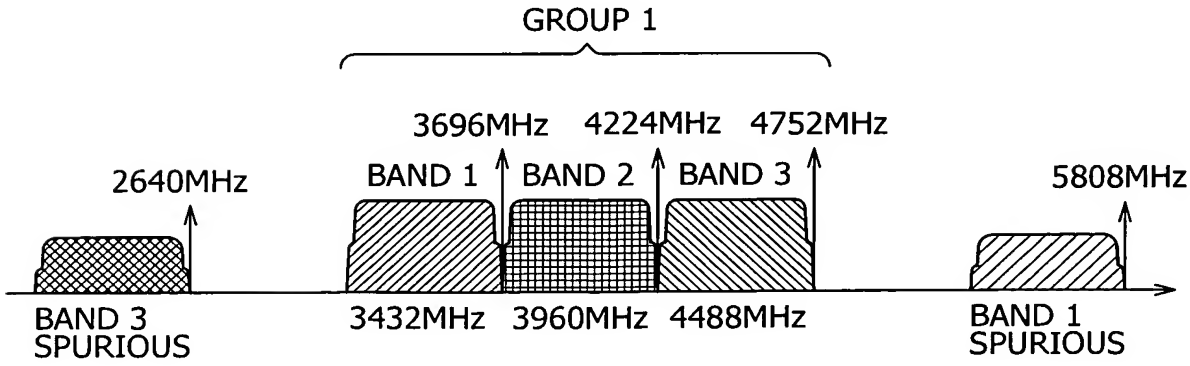

GROUP 1
3696MHz
4224MHz
4752MHz
2640MHz
BAND 1
BAND 2
BAND 3
5808MHz
BAND 3
SPURIOUS
3432MHz
3960MHz
4488MHz
BAND 1
SPURIOUS

FIG. 17

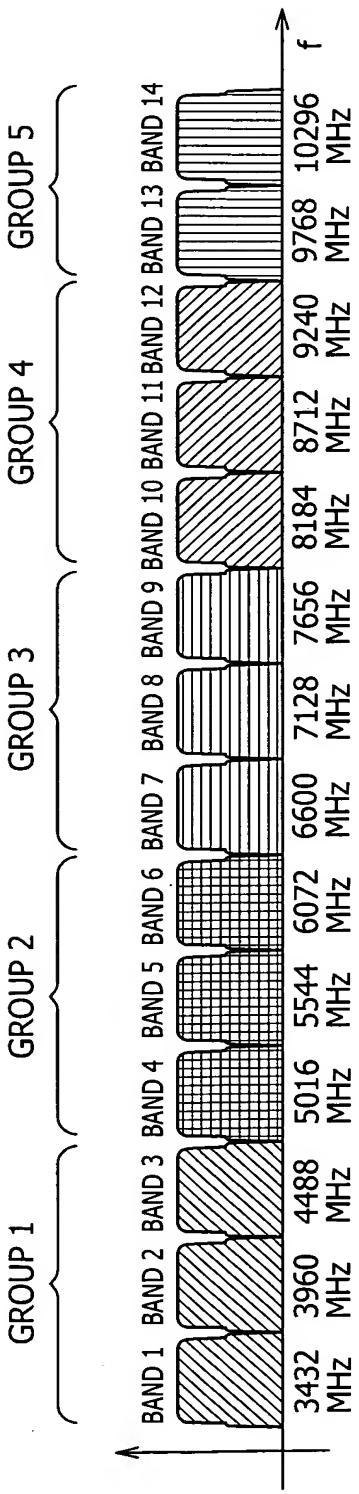

GROUP 1
GROUP 2
GROUP 3
GROUP 4
GROUP 5
BAND 1
BAND 2
BAND 3
BAND 4
BAND 5
BAND 6
BAND 7
BAND 8
BAND 9
BAND 10
BAND 11
BAND 12
BAND 13
BAND 14
3432 MHz
3960 MHz
4488 MHz
5016 MHz
5544 MHz
6072 MHz
6600 MHz
7128 MHz
7656 MHz
8184 MHz
8712 MHz
9240 MHz
9768 MHz
10296 MHz
f

FIG. 18

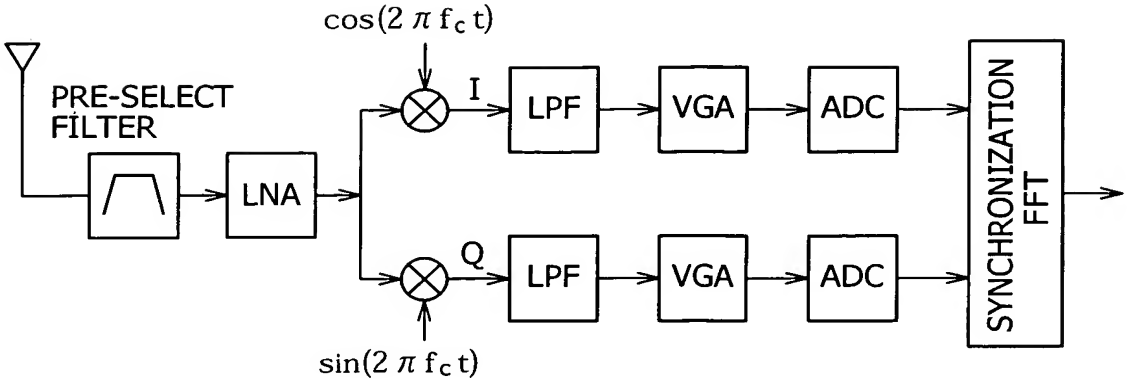


FIG. 19

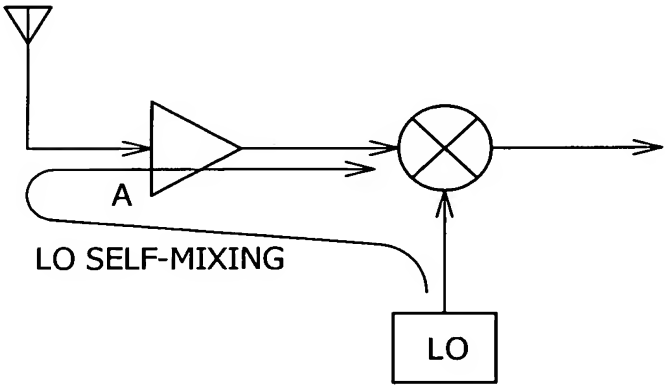


FIG. 20

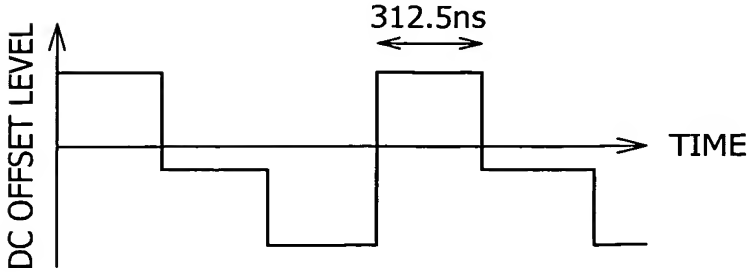


FIG. 21

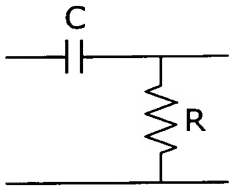


FIG. 22

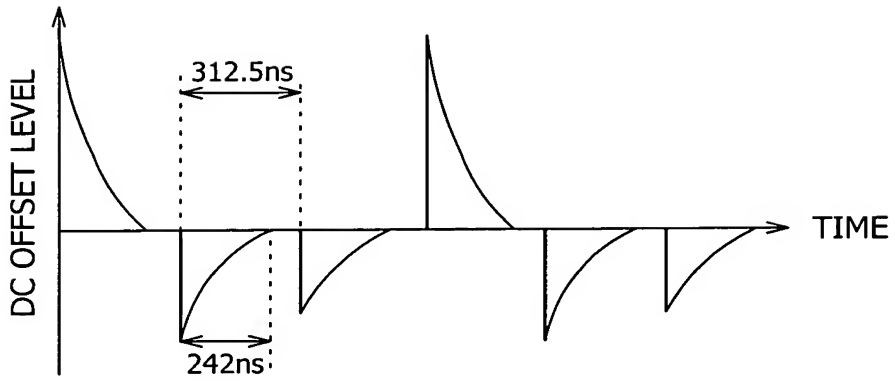


FIG. 23

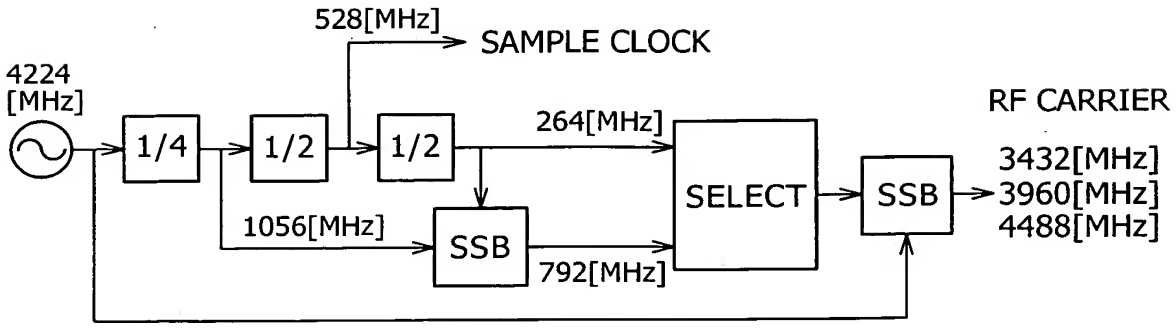
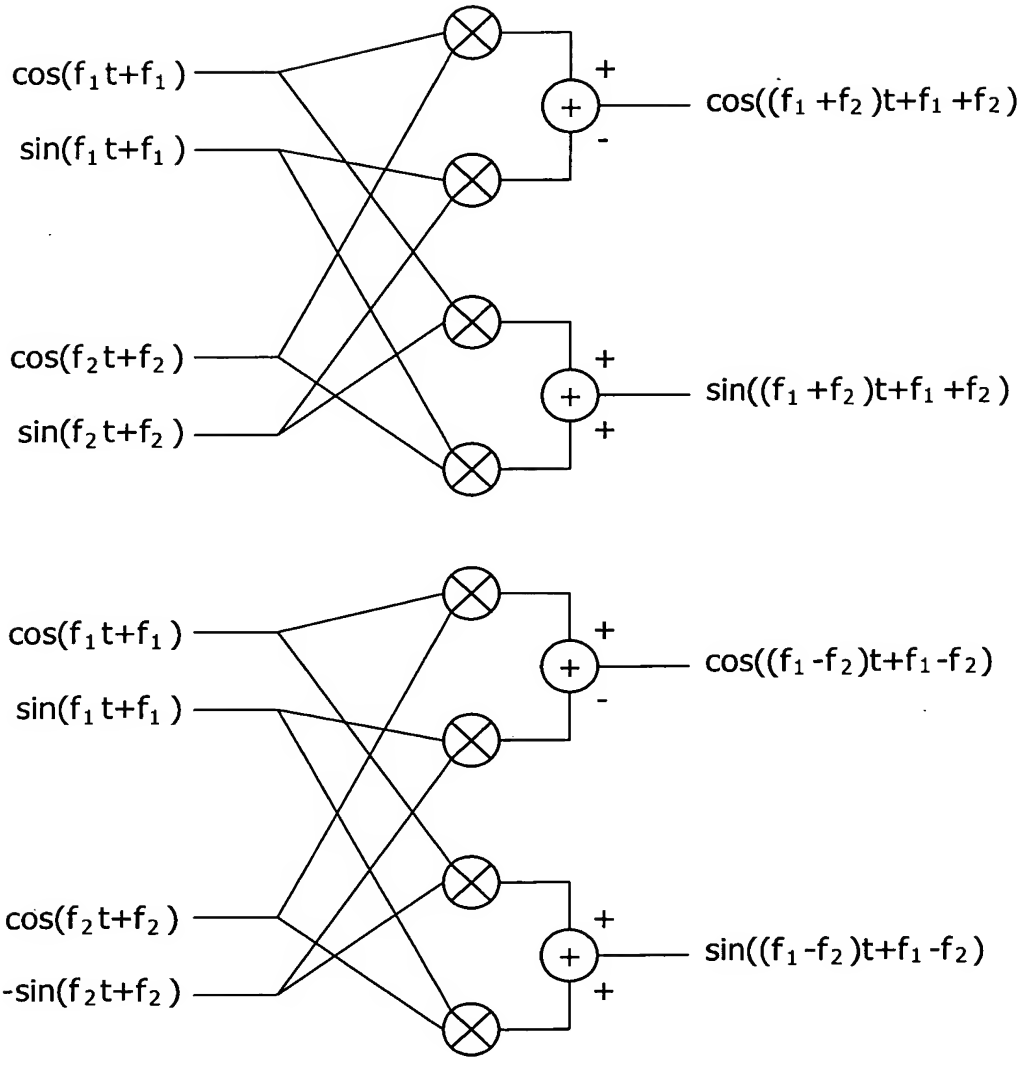


FIG. 24


cos(f1t+f1)
sin(f1t+f1)
cos(f2t+f2)
sin(f2t+f2)
+
+
-
cos((f1+f2)t+f1+f2)
+
+
+
sin((f1+f2)t+f1+f2)
cos(f1t+f1)
sin(f1t+f1)
cos(f2t+f2)
-sin(f2t+f2)
+
+
-
cos((f1-f2)t+f1-f2)
+
+
+
sin((f1-f2)t+f1-f2)

Oblon, Spivak, et al.
703-413-3000

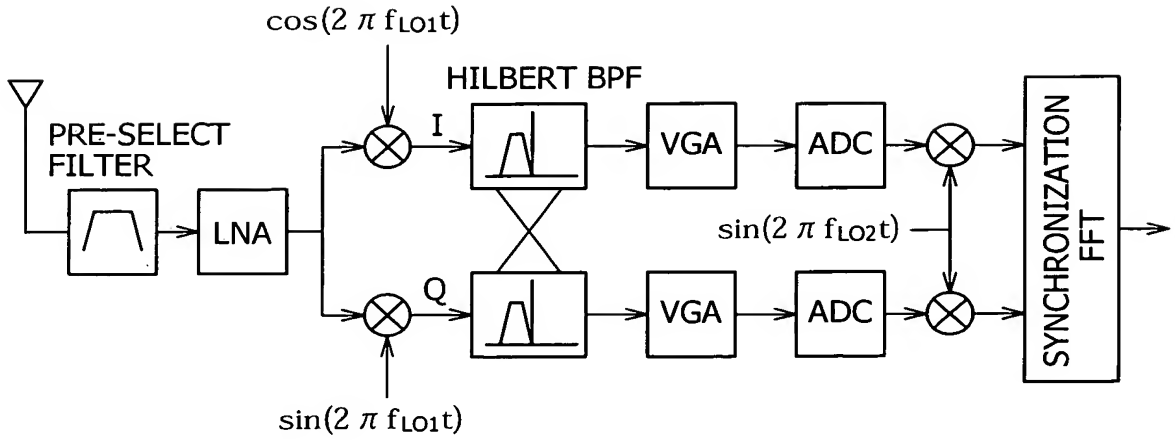



FIG. 25